

Claims

- [c1] 1. A diaphragm and seat assembly disposable within a diaphragm valve, the assembly comprising:
one or more diaphragms;
a diaphragm cap for supporting one side of the one or more diaphragms;
a diaphragm plate for supporting an opposite side of the one or more diaphragms; and
a valve seat for engaging with the one or more diaphragms, thereby blocking flow through the diaphragm valve when engaged with the one or more diaphragms and allowing flow through the diaphragm valve when disengaged with the one or more diaphragms;
wherein the diaphragm cap and the diaphragm plate are fixedly joined together with the one or more diaphragms disposed there between, providing a singular assembly for disposal within the diaphragm valve.
- [c2] 2. The diaphragm and seat assembly according to claim 1, further comprising a valve body for receiving the diaphragm and seat assembly.
- [c3] 3. The diaphragm and seat assembly according to claim 1, further comprising a valve actuator able to engage the assembly for operation of the one or more diaphragms.
- [c4] 4. The diaphragm and seat assembly according to claim 3, the diaphragm cap further comprising a central through-hole through which the actuator operates the one or more diaphragms.
- [c5] 5. The diaphragm and seat assembly according to claim 4, the actuator further comprising a valve stem for operating the one or more diaphragms.
- [c6] 6. The diaphragm and seat assembly according to claim 1, the diaphragm plate further comprising a central plate through-hole for receiving the valve seat.
- [c7] 7. The diaphragm and seat assembly according to claim 6 wherein the valve seat is removable from the diaphragm and seat assembly.
- [c8] 8. The diaphragm and seat assembly according to claim 2, further comprising a

valve actuator engageable with the valve body for securing the diaphragm and seat assembly within the valve body.

- [c9] 9. The diaphragm and seat assembly according to claim 2, the diaphragm plate further comprising a toroid for engaging with the valve body thereby creating an atmospheric seal.
- [c10] 10. The diaphragm and seat assembly according to claim 9, the valve body further comprising a groove for receiving the toroid, whereby a series of one or more atmospheric seals are created.
- [c11] 11. A diaphragm valve comprising:
a valve actuator for operating at least one diaphragm;
a valve body having an inlet port and passage and an outlet port and passage and an internal chamber for providing fluid communication between the inlet port and passage and the outlet port and passage; and
a singular diaphragm assembly having at least one diaphragm disposed therein and a valve seat for engaging with the at least one diaphragm.
- [c12] 12. The diaphragm valve according to claim 11, the diaphragm assembly further comprising:
a diaphragm cap for supporting one side of the at least one diaphragm, and
a diaphragm plate for supporting an opposite side of the at least one diaphragm.
- [c13] 13. The diaphragm valve according to claim 11, the diaphragm assembly further comprising a toroid for engaging with the valve body, thereby creating an atmospheric seal.
- [c14] 14. The diaphragm valve according to claim 11, the valve body further comprising a groove for receiving the diaphragm assembly, thereby creating at least one atmospheric seal.
- [c15] 15. The diaphragm valve according to claim 11 wherein the valve seat is removable from the diaphragm assembly.
- [c16] 16. The diaphragm valve according to claim 11, wherein the internal chamber of

the valve body is able to receive the diaphragm assembly.

- [c17] 17. The diaphragm valve according to claim 11 wherein the valve actuator is connectable with the valve body with the diaphragm assembly disposed there between, whereby the valve seat and the at least one diaphragm are concentrically aligned with the valve body.
- [c18] 18. The diaphragm valve according to claim 11, the valve body further comprising a toroid for placement of the diaphragm assembly thereon, thereby concentrically aligning the diaphragm assembly with the valve body.
- [c19] 19. The diaphragm valve according to claim 11, the diaphragm assembly further comprising a groove for engaging with the valve body, whereby the diaphragm assembly is concentrically aligned with the valve body.
- [c20] 20. The diaphragm valve according to claim 11, the diaphragm assembly further comprising a toroid for engaging with the valve body, and the valve body further comprising a groove for receiving the toroid, whereby the diaphragm assembly is concentrically aligned with the valve body, and wherein at least one atmospheric seal is created by the engagement of the toroid with the valve body.